

Remarks

Claims 1-7 and 12-21 are pending in the application and are presented for reconsideration. Claims 1-3, 5-7, 12-14, and 16-21 have been amended; claims 8-11 have been canceled; and claims 4 and 15 remain in the application unchanged. No new matter has been added.

Claim Objections

Claims 6 and 17 are objected to because of the following informalities:

Claim 6, line 1, "3" should be changed to --5-- because claim 3 does not have one or more additional switchably conductive devices. Claim 6 has been amended to change "3" to --5--.

Claim 17, the same problem exists as noted in claim 6, and further, the limitation one or more additional switchably conductive devices should be added to avoid double patenting, see claim 15. Claim 17 has been amended to change "14" to --16--, and to add "".

The objections to claims 6 and 17 are believed to be overcome.

Claim Rejections

Claims 1, 3, 7, 12, 14, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Davis (U.S. Pat. No. 5,036,222).

Claims 2, 5 and 13-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable by Davis in view of Vajapey et al (U.S. Pat. No. 5,877,647).

Claims 4, 15, and 19-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable by Davis in view of Kuo (U.S. Pat. No. 4,386,286).

Claims 6-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable by Davis in view of Vajapey in view of Kuo.

The Examiner's rejections of the claims are respectfully traversed.

1. Legal standard for Rejecting Claims Under 35 U.S.C. §102/103

Under 35 U.S.C. § 102, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628 (Fed. Cir.), *cert. denied*, 484 U.S. 827 (1987).

2. Response to Rejections of Claims Under 35 U.S.C. § 102/103

a. Claims 3-6

Applicant's claim 3 recites:

An apparatus for reducing the slew rate of transition edges of a digital signal on a node of an integrated circuit, comprising:

a first switchably conductive device characterized by a first threshold voltage of a given polarity, said first switchably conductive device connected between said node and a voltage source and having a control input connected to a driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said first threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said first threshold voltage; and

a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity greater than said first threshold voltage, said second switchably conductive device connected between said node and said voltage source and having a control input connected to said driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said second threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said second threshold voltage.

The Davis Reference

The Examiner cites Davis as anticipating claim 3. In particular, the Examiner seeks to equate Davis' N1 with Applicant's first switchably conductive device, and Davis' "blackbox combination" of P4 and N2-N3 with Applicant's second switchably conductive device.

Davis does not teach "a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity greater than said first threshold voltage, said

second switchably conductive device connected between said node and said voltage source and having a control input connected to said driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said second threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said second threshold voltage” as recited in Applicant’s claim 1. The Examiner states in the Office Action, page 3, lines 15-23, that the combination of P4 and N2-N3 may be considered to be a “blackbox” which covers P4 and N2-N3 having an input terminal connected to the gate of N1, an output terminal connected to VOUT, and a further terminal connected to GND. In other words, the input terminal to the blackbox is the source of P4 and the output of the blackbox is the drain of N3.

The Examiner further states in the Office Action at page 8, paragraph 7 in the Response to Arguments, that the “blackbox” has a control input terminal connected to the gate of N1 for receiving the same driving signal. The Examiner states further that since the “blackbox” receives the driving signal at this terminal, this terminal is seen as the control input terminal, and since the “blackbox” allows current flow from VOUT to GND through the “blackbox” when the driving signal is increased to a certain voltage, it is proper to interpret the “blackbox” as a switchably conductive device.

Importantly, according to the Examiner’s interpretation of the “blackbox” just enumerated, the “blackbox” has a *control input terminal connected to the gate of N1 for receiving the same driving signal* as that of the first switchably conductive device (N1). However, this means that N1 must be included as an element of the alleged “blackbox” equivalent to N2. This is true because P4 cannot begin to turn on until N1 is first turned on under the control of the driving signal present on the gate of N1. Since no other element can be said to control the turning on of the “blackbox” combination (i.e., P4, N3, and N2), and since the driving signal is connected only to the gate of N1 and not to the gate of P4, N1 must be considered a part of the “blackbox” combination. Since the “blackbox”

combination equivalent of Applicant's second switchably conductive device must include N1, and since N1 is also considered the equivalent of Applicant's "first switchably conductive device", it is clear that since N1 is a shared element, that the alleged "second switchably conductive device" (or "blackbox" combination including N1) is not independent of the alleged "first switchably conductive device" (or N1).

Since Davis does not meet each and every limitation of Applicant's claim 3, per *Verdegaal Bros., Inc., supra*, Davis cannot be used in formulating an anticipation rejection under 35 U.S.C. § 102.

The Vajapey Reference

Vajapey does not make up for the deficiencies of Davis in meeting Applicant's claim 3. The Applicant repeats the arguments presented in the Applicant's Responses to the previous two Office Actions, which in summary explain that Vajapey does not teach or suggest at least the use of a "second switchably conductive device ... characterized by a second threshold voltage of said given polarity greater than said first threshold voltage" and nor can it be combined with Davis in meeting this limitation. Accordingly, Davis cannot be combined with Vajapey to properly form even a § 103 rejection of Applicant's claim 3.

The Kuo Reference

Kuo discloses a pair of N channel transistors 24 and 25 having a common gate 26 and having parallel current paths connected (via transistor 20) between voltage supply Vcc and a node. The transistor 24 is a depletion mode device and the transistor 25 is a "natural" or unimplanted low-threshold enhancement mode transistor.

It is well-known in the art that in the case of an N channel transistor, the device is said to be an "enhancement mode" device because channel conduction is enhanced by a charge applied to the gate, whereas the device is said to be a "depletion mode" device because channel conduction is depleted by a charge applied to the gate. Accordingly, an "enhancement mode" transistor acts as a

"normally open" switch, whereas a "depletion mode " transistor acts as a "normally closed" switch. Conduction occurs in the channel region when no charge is applied to the gate. If a negative charge is applied to the gate, then the negative charge carriers in the thin N-doped region immediately beneath the gate oxide will be repelled from this region, leaving no free charge carriers, and conduction will cease. In a depletion mode transistor, a negative charge applied to the gate turns the transistor *off*.

Kuo does not make up for the deficiencies of Davis in meeting Applicant's claim 3. Kuo does not teach "a first switchably conductive device characterized by a first threshold voltage of a given polarity, said first switchably conductive device connected between said node and a voltage source and having a control input connected to a driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said first threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said first threshold voltage". For the purposes of argument, we will assume an equivalence between Kuo's "natural" low-voltage transistor 25 and Applicant's "second switchably conductive device" (since by definition the "natural" low-voltage enhancement mode transistor 25 has a higher threshold voltage than a depletion mode device). However, if this equivalence is drawn, then Kuo's depletion mode transistor 24 cannot be equated with Applicant's "first switchably conductive device" because both of Applicant's "first switchably conductive device" and "second switchably conductive device" must be of the *same* polarity (e.g., the first switchably conductive device has a first threshold voltage "of a given polarity" and the second switchably conductive device has a second threshold voltage "of said given polarity"). In Kuo, the threshold voltage of depletion mode device 24 is zero or negative, whereas the threshold voltage of enhancement mode device 25 is positive. Therefore, the assumed equivalence cannot stand. Accordingly, Kuo does not meet the limitations "a first switchably conductive device characterized by a first threshold voltage of a given polarity, said first switchably conductive

device connected between said node and a voltage source and having a control input connected to a driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said first threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said first threshold voltage” and “a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity greater than said first threshold voltage, said second switchably conductive device connected between said node and said voltage source and having a control input connected to said driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said second threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said second threshold voltage” recited in Applicant’s claim 3.

Furthermore, the teachings of Kuo teach away from combination with Davis because for devices, the driving signal in Davis transitions only from low to high (0 to Vcc) or high to low (Vcc to 0). There is no suggestion in Davis that the driving signal switches polarities. Accordingly, because the driving signal does not switch polarities, the depletion mode transistor will always be “on” or conducting current. Therefore, such a combination would not achieve the bifurcated turn-on of an output driver, thereby rendering Davis inoperative for its intended purpose. Accordingly, Kuo cannot even be properly combined with Davis to satisfy a § 103 rejection.

Accordingly, for all the above reasons, Kuo does not anticipate and cannot even be combined with Davis and Vajapey to meet the limitations of Applicant’s Claim 3.

Summary

Accordingly, in view of the above, none of Davis, Vajapey, or Kuo, taken either alone or in any combination, meets each and every limitation of Applicant’s claim 3. Per *Verdegaal Bros., Inc., supra*, therefore none of Davis, Vajapey, or

Kuo can be used in formulating an anticipation rejection under 35 U.S.C. § 102. Furthermore, since none of Davis, Vajapey, or Kuo, taken in any combination, teach the essential limitations “a first switchably conductive device characterized by a first threshold voltage of a given polarity, said first switchably conductive device connected between said node and a voltage source and having a control input connected to a driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said first threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said first threshold voltage” and “a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity greater than said first threshold voltage, said second switchably conductive device connected between said node and said voltage source and having a control input connected to said driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said second threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said second threshold voltage”, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 3 should be withdrawn and that claim 3 is now in position for allowance.

Claims 4-6 each depend from independent base claim 3 and add further limitations. For at least the same reasons that Claim 3 is not shown, taught, or disclosed by the cited references, Claims 4-6 are likewise not shown, taught, or disclosed. Thus, Applicant respectfully submits that the rejection of claims 4-6 should be withdrawn.

b. Claims 1-2

Claim 1 recites similar limitations as claim 3, in method form. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 1. Furthermore, for the same reasons as

set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 1 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 1 should be withdrawn and that claim 1 is now in position for allowance.

Claim 2 depends from independent base claim 1 and adds further limitations. For at least the same reasons that Claim 1 is not shown, taught, or disclosed by the cited references, claim 2 is likewise not shown, taught, or disclosed. Thus, Applicant respectfully submits that the rejection of claim 2 should also be withdrawn.

c. Claim 7

Claim 7 recites similar limitations as claim 3, including the identical limitations "a first switchably conductive device characterized by a first threshold voltage of a given polarity, said first switchably conductive device connected between said node and a voltage source and having a control input connected to a driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said first threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said first threshold voltage" and "a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity greater than said first threshold voltage, said second switchably conductive device connected between said node and said voltage source and having a control input connected to said driving signal to allow current conduction from said voltage source to said node when a voltage level of said driving signal is equal to and greater than said second threshold voltage and to disallow said current conduction when said voltage level of said driving signal is less than said second threshold voltage". For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 7.

Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 7 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 7 should be withdrawn and that claim 7 is now in position for allowance.

d. Claims 12-13

Claim 12 recites similar limitations as claim 3, in method form. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 12. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 12 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 12 should be withdrawn and that claim 12 is now in position for allowance.

Claim 13 depends from independent base claim 12 and adds further limitations. For at least the same reasons that Claim 12 is not shown, taught, or disclosed by the cited references, claim 13 is likewise not shown, taught, or disclosed. Thus, Applicant respectfully submits that the rejection of claim 13 should also be withdrawn.

e. Claims 14-17

Claim 14 recites similar limitations as claim 3, including the identical limitations “a first switchably conductive device characterized by a first threshold voltage of a given polarity” and “a second switchably conductive device independent from said first switchably conductive device characterized by a second threshold voltage of said given polarity”. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 14. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to

formulate an obvious-type rejection of claim 14 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 14 should be withdrawn and that claim 14 is now in position for allowance.

f. Claim 18

Claim 18 recites similar limitations as claim 3. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 18. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 18 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 18 should be withdrawn and that claim 18 is now in position for allowance.

g. Claim 19

Claim 19 recites similar limitations as claim 3. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 19. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 19 under 35 U.S.C. § 103. (Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 9 should be withdrawn and that claim 19 is now in position for allowance.

h. Claim 20

Claim 20 recites similar limitations as claim 3. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 20. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 20 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 9 should be withdrawn and that claim 20 is now in position for allowance.

i. Claim 21

Claim 21 recites similar limitations as claim 3. For the same reasons that Davis does not meet the limitations of claim 3, Davis also does not meet the limitations of claim 21. Furthermore, for the same reasons as set for above in the arguments to claim 3, Davis, Vajapey, or Kuo cannot even be combined to formulate an obvious-type rejection of claim 21 under 35 U.S.C. § 103. Accordingly, Applicant respectfully submits that the 35 U.S.C. § 102 rejection of claim 9 should be withdrawn and that claim 21 is now in position for allowance.

Conclusion

In view of the foregoing remarks, it is respectfully submitted that none of the references cited by the Examiner taken alone or in any combination shows, teaches, or discloses the claimed invention, and that Claims 1-7 and 12-21 are in condition for allowance. Reexamination and reconsideration are respectfully requested.

Should the Examiner have any questions regarding this amendment, or should the Examiner believe that it would further prosecution of this application, the Examiner is invited to call the undersigned.

Respectfully submitted,



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